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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/930,847

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Po-Sheng Shih

JCLA6974

2113

7590

10/02/2002

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EXAMINER

LEWIS, MONICA

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 10/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/930,847

Applicant(s)

SHIH, PO-SHENG

Examiner

Monica Lewis

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 15-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. This office action is in response to the amendment filed July 30, 2002.

#### *Response to Arguments*

2. Applicant's arguments with respect to claims 15-20 have been considered but are moot in view of the new ground(s) of rejection.

#### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as obvious over Applicant's Prior Art Drawings in view of Wu (U.S. Patent No. 5,977,561) and Cho et al. (U.S. Patent No. 5,578,838).

In regards to claim 15, Applicant's Prior Art Drawings disclose the following:

- a) an insulating substrate (100) (See Figure 1b);
- b) a polysilicon layer over the substrate (104) (See Figure 1b); and
- c) a gate structure over the polysilicon layer, wherein the gate structure includes a gate layer (108), a gate dielectric layer (106) between the gate layer and the polysilicon layer (See Figure 1b).

In regards to claim 15, Applicant's Prior Art Drawings fails to disclose the following:

- a) a spacer on each side of the gate layer.

However, Wu discloses a semiconductor device that has a spacer (24) on each side (See Figure 7). It would have been obvious to one having ordinary skill in the art at the time the

invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include a spacer as disclosed in Wu because it aids in isolating the gate, source and drain regions.

b) a conductive layer serves as a source/drain region.

However, Cho et al. ("Cho") discloses a semiconductor device that has a conductive layer (14) that functions as a source/drain region (See Figure 4 and Column 4 Lines 53-55). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include a conductive layer as disclosed in Cho because it aids in providing a connection among the layers.

In regards to claim 16, Applicant's Prior Art Drawings disclose the following:

a) the polysilicon layer has a thickness between about 250A to 350A (See Page 2 Lines 11-12).

5. Claim 17 is rejected under 35 U.S.C. 103(a) as obvious over Applicant's Prior Art Drawings in view of Wu (U.S. Patent No. 5,977,561), Cho et al. (U.S. Patent No. 5,578,838) and Kawachi et al. (U.S. Patent No. 6,104,040).

In regards to claim 17, Applicant's Prior Art Drawings fails to disclose the following:

a) the conductive layer includes an in-situ doped silicon-germanium (SiGe) layer.

However, Kawachi et al. ("Kawachi") discloses a semiconductor device that has a thin film transistor with a SiGe conductive layer (See Column 2 Lines 51-55 and Column 7 Lines 22-28). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include a SiGe layer as disclosed in Kawachi because it aids in increasing the speed of the device.

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6. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as obvious over Applicant's Prior Art Drawings in view of Wu (U.S. Patent No. 5,977,561), Cho et al. (U.S. Patent No. 5,578,838) and Nakajima et al. (U.S. Patent No. 6,118,140).

In regards to claim 18, Applicant's Prior Art Drawings fails to disclose the following:

a) the conductive layer is tungsten.

However, Nakajima et al. ("Nakajima") discloses a semiconductor device that has conductive layer of tungsten (See Column 19 Lines 4-10). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include a tungsten layer as disclosed in Nakajima because it aids in providing a connection among the metal layers.

In regards to claim 19, Applicant's Prior Art Drawings fails to disclose the following:

a) the conductive layer is metal silicide.

However, Nakajima discloses a semiconductor device that has conductive layer of metal silicide (See Column 19 Lines 4-10). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include a metal silicide layer as disclosed in Nakajima because it aids in providing a connection among the layers.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as obvious over Applicant's Prior Art Drawings in view of Wu (U.S. Patent No. 5,977,561), Cho et al. (U.S. Patent No. 5,578,838) and Gardner et al. (U.S. Patent No. 5,872,376).

In regards to claim 20, Applicant's Prior Art Drawings fails to disclose the following:

a) the spacer is a tetra-ethyl-ortho-silicate (TEOS) layer.

However, Gardner et al. ("Gardner") discloses a semiconductor device that has spacer comprised of TEOS (See Column 19 Lines 4-10). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include a spacer layer as disclosed in Gardener because it aids in isolating the gate, source and drain regions.

### ***Conclusion***

8. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure: a) Wu (U.S. Patent No. 5,956,580) discloses an ultrashort channel mosfet; b) Hu et al. (U.S. Patent No. 6,015,997) discloses a semiconductor structure with a conductive layer; c) Jang et al. (U.S. Patent No. 6,037,611) discloses a thin film transistor; d) Hsu et al. (U.S. Patent No. 5,573,964) discloses a method of making a thin film transistor; e) Yamashita (U.S. Patent No. 5,841,173) discloses a MOS semiconductor device; f) Tsutsumi (U.S. Patent No. 6,018,181) discloses a thin film transistor; g) Wieczorek et al. (U.S. Patent No. 6,037,232) discloses a semiconductor device having an elevated silicidation layer; h) Hu (U.S. Patent No. 6,100,185) discloses a semiconductor processing method; and i) Lai et al. (U.S. Patent No. 6,399,487) discloses a method of reducing phase transition..

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 703-305-3743.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 703-308-4940. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML

September 25, 2002

  
CARL WHITEHEAD, JR.  
SUPERVISORY PATENT EXAMINER  
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